

## **WATER SCARCITY: THE EMERGING HUMAN RIGHTS ISSUE OF THE NEW WORLD ORDER**

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### **Introduction**

No water, no life. No blue, no green.

- Sylvia Earle.

An American Marine Biologist; Sylvia Earle rightly said, that without water there is no life. And without water, there would be no water bodies or any plants and trees. Water- the natural resource that begets life. Oxygen in form of air is inevitable to life, so is water. One only breathes air and is required for combustion, water is required to sustain all life on this planet and life functions of all the living beings.

Water is one of the most vital natural resources for all life on Earth. The availability and quality of water always have played an important part in determining not only where people can live, but also their quality of life. Even though there always has been plenty of fresh water on Earth, water has not always been available when and where it is needed, nor is it always of suitable quality for all uses. Water must be considered as a finite resource that has limits and boundaries to its availability and suitability for use. The balance between supply and demand for water is a delicate one. The availability of usable water has and will continue to dictate where and to what extent development will occur. Water must be in sufficient supply for an area to develop, and an area cannot continue to develop if water demand far outstrips available supply.<sup>1</sup>

Water scarcity has been an emerging problem worldwide. Human profligacy of the abundant natural resource; water, has resulted in the worldwide crisis of water as we see today.

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<sup>1</sup> Uses of Water - building, river, oceans, important, largest, plants, source, human. (n.d.). Retrieved from <http://www.waterencyclopedia.com/Tw-Z/Uses-of-Water.html> [accessed 23 April, 2018]

One may argue that why is there a scarcity of water when the seas and oceans are all filled with water in abundance. One must realize that the water contained in the seas and oceans is not ready to use water that can sustain life and life functions. People are dying endlessly due to unavailability of water as well as the food security in the world is dwindling as all plantation to grow requires almost perennial supply of good quality water. The condition in certain developing nations like India, several African nations, the war torn countries like Libya and Syria, is deplorable and unpardonable in the context of Human Rights.

Freshwater “scarcity”<sup>2</sup> and security<sup>3</sup> have been identified as major global environmental problems of the 21st century. Although global population is expected to increase to about 9 billion by 2050<sup>4</sup>, the planet’s endowment of accessible renewable freshwater has been and will remain more or less constant<sup>5</sup>.

In the past decade, there has been increasing evidence of the interconnected nature of the global system<sup>6</sup> through the hydro-climatic system and “virtual water” transfers among regions. But despite the recognition of the existence of a global hydro-commons<sup>7</sup>, most water is abstracted, managed, and used at the regional to local scale (state, city, micro-watershed, and basin). Depending on the local socioeconomic, political, and hydrologic circumstances, the common global drivers of change, such as climate change, population growth, and globalization, have diverse regional impacts.

Human rights, as defined by the Universal Declaration of Human Rights, 1948, are rights inherent to all human beings, regardless of race, sex, nationality, ethnicity, language, religion, or any other status. Human rights include the right to life and liberty, freedom from slavery and

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<sup>2</sup> Jury, W. A., & Vaux, H. (2005). The role of science in solving the world's emerging water problems. *Proceedings of the National Academy of Sciences*, 102(44), 15715-15720. doi:10.1073/pnas.0506467102

<sup>3</sup> Vorosmarty, C. J. (2000). Global Water Resources: Vulnerability from Climate Change and Population Growth. *Science*, 289(5477), 284-288. doi:10.1126/science.289.5477.284

<sup>4</sup> Gleick, P. H., & Palaniappan, M. (2010). Peak water limits to freshwater withdrawal and use. *Proceedings of the National Academy of Sciences*, 107(25), 11155-11162. doi:10.1073/pnas.1004812107

<sup>5</sup> Postel, S. L., Daily, G. C., & Ehrlich, P. R. (1996). Human Appropriation of Renewable Fresh Water. *Science*, 271(5250), 785-788. doi:10.1126/science.271.5250.785

<sup>6</sup> Alcamo, J. M., Vörösmarty, C. J., Naiman, R. J., Lettenmaier, D. P., & Pahl-Wostl, C. (2008). A grand challenge for freshwater research: understanding the global water system. *Environmental Research Letters*, 3(1), 010202. doi:10.1088/1748-9326/3/1/010202

<sup>7</sup> Hoekstra, A. Y., & Mekonnen, M. M. (2012). The water footprint of humanity. *Proceedings of the National Academy of Sciences*, 109(9), 3232-3237. doi:10.1073/pnas.1109936109

torture, freedom of opinion and expression, the right to work and education, and many more. Everyone is entitled to these rights, without discrimination.<sup>8</sup> Hence, since water is inexorable to life, there is gross violation and infringement of human rights when there is colossal water scarcity. This scarcity and deficit emanates from the lavish and profuse use of water in certain parts of the world where on the other hand people are dying to have a few sips of the same water.

The water coverage of the earth is almost three fourths as that compared to the land masses. Similarly, human body also constitutes of more than 70% water. Water is the essence of life.

In November 2002, the Committee on Economic, Social and Cultural Rights adopted General Comment No. 15 on the right to water. Article I states that "The human right to water is indispensable for leading a life in human dignity. It is a prerequisite for the realization of other human rights". Comment No. 15 also defined the right to water as the right of everyone to sufficient, safe, acceptable and physically accessible and affordable water for personal and domestic uses.<sup>9</sup>

On 28 July 2010, through Resolution 64/292, the United Nations General Assembly explicitly recognized the human right to water and sanitation and acknowledged that clean drinking water and sanitation are essential to the realization of all human rights. The Resolution calls upon States and international organizations to provide financial resources, help capacity-building and technology transfer to help countries, in particular developing countries, to provide safe, clean, accessible and affordable drinking water and sanitation for all.<sup>10</sup>

According to UN Water, the right to water entitles everyone to have access to sufficient, safe, acceptable, physically accessible and affordable water for personal and domestic use and the right to sanitation entitles everyone to have physical and affordable access to sanitation, in

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<sup>8</sup> Human Rights. (2017, October 31). Retrieved from <http://www.un.org/en/sections/issues-depth/human-rights/> [accessed 20 April, 2018]

<sup>9</sup> Human right to water and sanitation | International Decade for Action 'Water for Life' 2005-2015. (n.d.). Retrieved from [http://www.un.org/waterforlifedecade/human\\_right\\_to\\_water.shtml](http://www.un.org/waterforlifedecade/human_right_to_water.shtml) [accessed 24 April, 2018]

<sup>10</sup> *ibid.*

all spheres of life, that is safe, hygienic, secure, and socially and culturally acceptable and that provides privacy and ensures dignity.

Even though these standards are laid down by the UN, their realization in most parts of the world is very poor. Men, women and children alike are harassed daily only to get access to clean drinking water and water for sanitation purposes across many parts of the globe. Children and the diseased bear most of the brunt of the crisis situation as they are the most vulnerable groups.

Thus, right to life also includes right to water and in order to attain the highest yet most fundamental right to life, water must be provided to every living person on the face of this earth without any discriminations, as human life does not merely mean animal existence but is meant to be a life complete with health, nourishment and dignity.

### **Research Objective**

The said study on water scarcity in India has been undertaken with the following objectives:

- To study the problem of water scarcity in various parts of India.
- To understand whether India is facing an impending danger of day zero in the near future.
- To investigate the causes of water scarcity in India.
- To probe whether there are serious human rights violations due to water scarcity.
- To provide for suggestions as part of human duty to conserve water in all possible ways.

### **Research Hypothesis**

Water in India is abundantly available due to its geographical placing but the same is not available for use by the people since politics, corruption, human greed for more and more water, lack of awareness on water management and conservation and lastly global warming are leading to a massive water crisis in the country thus endangering the human rights of the people.

### **Global water crisis**

The explosion of world population and raised standards of living worldwide has caused immense depletion of natural resources. Most natural resources whether renewable or non-renewable are on the verge of completely being exhausted and barely anything left for the generations to come.

In the cutting edge competition, man has forgotten to conserve all the natural resources available to him and is utilizing them for his self-serving motives as if there is no tomorrow. The thinkers, conservation experts and others who believe that these resources must be present even to serve the generations to come are coming up with alternate means in a drive to conserve these resources and prevent them from total exhaustion.

Water is one such resource. A simple molecule comprising of two atoms of hydrogen and one atom of oxygen is inevitable for life. The most widely and abundantly available natural resource; water, is now on the brink of drying up. Unfortunately, there is no substitute for water that has been found in order to serve the same benefits as that of water.

Water, if required to be produced in a chemical laboratory, is a cumbersome process as the reaction is explosive in nature. Hence, water cannot be created in large amounts.

One of the prime reasons for water scarcity is that water is being depleted at a faster rate than it is being replenished and hence, the imbalance is growing valley deep with no resort and ways to replenish the same.

The researcher in the current chapter has sought to shed light on the global scenario in the context of water scarcity and the steps taken by the world bodies to conserve water and overcome the problem of water scarcity and related issues all over the world.

## **Day zero**

Day Zero does not mean that there is no water in our dams. It does mean, however, that the dams are at a crucial low. This crucial low means that dam storage will be at 13.5%. This is when the City will turn off most taps, leaving only vital services with access to water.

On Day Zero, Cape Town residents will have to collect water at 200 collection sites or points of distribution in Cape Town. The City estimates that about 20 000 people will be able to collect water per site per day. The collection points have not yet been announced.<sup>11</sup>

Day zero in other words is a day where there would be no water running from the taps and there would be conservation of every drop of water. According to the World Health Organization (WHO), between 50 and 100 liters of water per person per day are needed to ensure that most basic needs are met and few health concerns arise. With day zero in place, the per person consumption of water would drop below 25 liters.

Although Day Zero has been pushed to the year 2019 in Cape Town, as per published reports<sup>12</sup>, in India too many cities like Bengaluru are facing dangers of facing a day zero in the very near future.

A water-starved Bengaluru, it is believed, might make this infamous cut as it is seen as edging towards a crisis of epic proportions. With natural water bodies becoming victims of concretization and rainwater harvesting being a low priority, the tech capital's future appears grim in terms of meeting the water requirements of its one-crore-plus people. In fact, alarm bells rang loud to this effect when a BBC report, reportedly based on UN-endorsed projections, listed Bengaluru in the second position after Brazil's Sao Paulo among the 11 global cities that are likely to run of drinking water.<sup>13</sup>

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<sup>11</sup> 7 things you need to know about #DayZero | IOL News. (2018, January 19). Retrieved from <https://www.iol.co.za/news/south-africa/western-cape/7-things-you-need-to-know-about-dayzero-12801609> [accessed 25 April, 2018]

<sup>12</sup> What happened to Cape Town's 'Day Zero'? (2018, May 18). Retrieved from <http://www.bbc.com/news/av/business-44170561/what-happened-to-cape-town-s-day-zero> [accessed 24 May, 2018]

<sup>13</sup> Water crisis: Is Bengaluru heading for Day Zero? - Times of India. (2018, February 13). Retrieved from <https://timesofindia.indiatimes.com/city/bengaluru/water-crisis-is-bluru-heading-for-day-zero/articleshow/62893432.cms> [accessed 29 March, 2018]

Thus it can be understood that in the very near future many cities across the world would dry up and be vulnerable to this great and devastating problem of acute water shortage and hence see the dawn to a day zero.

### **Countries severely affected by water shortage**

Water for human consumption always was a problem from times immemorial. Yet, in the middle ages with man rubbing shoulders with technology, this gap of water reaching from sources to the homes was filled and a completely new journey took off on the way to industrialization and globalization. The utilization of resources for the human avarice saw its pinnacle and the dawn of 21<sup>st</sup> century brought the difficulties that no one had foreseen. All the stocks of natural resources including water started dwindling and mankind has been facing some serious difficulties of all times since then.

There are several nations in the world which due to their geographical disposition are always vulnerable to severe drought like situations where on the other hand there are places where despite their placing on the globe is privileged in terms of availability of water resources, are yet facing great difficulties.

According to United Nations Department of Economic and Social Affairs (UNDESA) in its International Decade for Action 'Water for Life' 2005-2015, has submitted that;

- Around **700 million** people in 43 countries suffer today from water scarcity.
- By 2025, **1.8 billion** people will be living in countries or regions with absolute water scarcity, and two-thirds of the world's population could be living under water stressed conditions.
- With the existing climate change scenario, almost **half the world's population** will be living in areas of high water stress by 2030, including between 75 million and 250 million people in Africa. In addition, water scarcity in some arid and semi-arid places will displace between 24 million and 700 million people.

- **Sub-Saharan Africa** has the largest number of water-stressed countries of any region.<sup>14</sup>

An effort to identify the water crisis hit countries globally has been made by the researcher in the present study; to understand their geographical limitations along with the reckless utilization of man leading to the situations they are burgeoning in.

According to FewResources.org, by 2020 it's estimated that 1.8 billion people will experience absolute water scarcity, meaning there will be little to no water resources to live off of. Another two-thirds of the world will be dealing with water-stressed conditions, meaning water resources may be limited or hard to come by. Five years later in 2025, approximately 50 percent of the world will be experiencing severe water-stressed conditions. Yemen, Libya, Jordan, the Western Sahara and Djibouti are the top five countries currently dealing with extreme water scarcity. Geographical incapacities along with their unstable political climate remains a constant in these countries.

Due to the increasing rate of water shortage that happen to most countries today, most governments are searching for a solution in order to decrease the rate of it. From the research made by the experts, they discovered the Top 10 countries at risk of water shortage.

1. Somalia
2. Mauritania
3. Sudan
4. Niger
5. Iraq
6. Uzbekistan
7. Pakistan
8. Egypt
9. Turkmenistan
10. Syria<sup>15</sup>

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<sup>14</sup> *supra* note 9.

<sup>15</sup> Top 10 Countries At Risk Of Water Shortage | The Ecologist. (n.d.). Retrieved from [https://www.theecologist.co.uk/news/news\\_round\\_up/523066/report\\_lists\\_top\\_ten\\_countries\\_at\\_risk\\_of\\_water\\_shortages.html](https://www.theecologist.co.uk/news/news_round_up/523066/report_lists_top_ten_countries_at_risk_of_water_shortages.html) [accessed 30 April, 2018]

Also, there are several countries which are facing a water stress. These countries are:

1. Antigua and Barbuda
2. Bahrain
3. Barbados
4. Comoros
5. Cyprus
6. Dominica
7. Jamaica
8. Malta
9. Qatar
10. Saint Lucia
11. Saint Vincent and the Grenadines
12. San Marino
13. Singapore
14. Trinidad and Tobago
15. United Arab Emirates
16. Western Sahara (also listed in country facing extreme water scarcity)
17. Saudi Arabia
18. Kuwait
19. Oman
20. Libya (also listed in country facing extreme water scarcity)
21. Israel
22. Kyrgyzstan
23. East Timor
24. Iran
25. Yemen (also listed in country facing extreme water scarcity)
26. Palestine
27. Jordan (also listed in country facing extreme water scarcity)
28. Lebanon
29. Somaliland
30. Uzbekistan
31. Pakistan
32. Turkmenistan

33. Morocco
34. Mongolia
35. Kazakhstan
36. Afghanistan<sup>16</sup>

Thirty-three countries, some of which belong to the commonwealth, depend on other countries for over 50 percent of their renewable water resources: Argentina, Azerbaijan, Bahrain, Bangladesh, Benin, Bolivia, Botswana, Cambodia, Chad, Congo, Djibouti, Egypt, Eritrea, Gambia, Iraq, Israel, Kuwait, Latvia, Mauritania, Mozambique, Namibia, Netherlands, Niger, Pakistan, Paraguay, Portugal, Republic of Moldova, Romania, Senegal, Somalia, Sudan, Syrian Arab Republic, Turkmenistan, Ukraine, Uruguay, Uzbekistan, Viet Nam and Yugoslavia.

The scarcity and disparity of water resources are exacerbated by differing levels of usability (and therefore mobilization costs) and particularly by environmentally sustainable usability. Water quality also differs. Only a part of natural water resources can be contained and utilized. Basin management is generally recommended but is not common practice; it is unsuitable for arid areas (with no functional basin), large karstic zones and highly fragmented basins.

Scarcity and disparity are intensified by the threat and impact of human activity that disrupts water regimes and leads to a deterioration in water quality, and also by the vulnerable nature of some chronically over utilized resources: salinization of coastal aquifers (e.g. Spain and Israel) and the disappearance of sources (e.g. Tunisia). Moreover, the partitions between numerous countries (the Balkans, the Nile Basin) make the situation more complex.

Therefore, the inequalities among countries in accessing freshwater are amplified when considering the differences in development, treatment and rehabilitation works, as are the related costs required to obtain exploitable natural resources. The effort required varies significantly with the accessibility and regularity of the resources. For example, the ratio of

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<sup>16</sup> World's 36 Most Water-Stressed Countries | World Resources Institute. (n.d.). Retrieved from <http://www.wri.org/blog/2013/12/world%E2%80%99s-36-most-water-stressed-countries> [accessed 01 May, 2018]

exploitable water resources to total renewable resources is close to 100 percent in areas of the Mediterranean where the main source of water is groundwater (Israel, Gaza Strip (Palestinian Authority) and Libyan Arab Jamahiriya) but generally less than 70 percent in countries where surface water resources are important (Turkey, Morocco, Greece, etc.) and even lower where there are major technical constraints (Malta) or political restrictions (Portugal)<sup>17</sup>.

### **Causes and effects of water scarcity across the globe**

As seen in the previous section, the Food and Agricultural Organization (FAO) has categorized countries as water rich, water poor and water stressed. And as understood from the said categorization, there are multiple reasons and causes for those countries facing water crisis.

#### **▪ Water Pollution**

Water pollution is a major cause of water scarcity across the globe. The sources of water pollution include pesticides and fertilizers that wash away from farms, industrial and human waste that is directly dumped into rivers without treating it in water treatment plant. Oil spill on the ground, waste water leakage from landfills can seep underground and may pollute the groundwater making it unfit for human consumption.

Usage of plastics and dumping them into the water bodies serving us freshwater is causing problems for man itself and also endangering the flora and fauna present under water. The aquatic life seems to be threatened totally by the pollution dump hence altering the quality of water making it unfit for human consumption.

#### **▪ Overpopulation**

The rapid increase in human population combined by massive growth in industry sector have transformed water ecosystems and resulted in loss of biodiversity. As population is increasing at an ever increasing rate, the demand for new resources will result in additional pressure on freshwater sources.

It can be understood that because of tremendous advance in the healthcare sector, longevity and population explosion have resulted. The geographically well placed locations are the most

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<sup>17</sup> WORLD WATER RESOURCES BY COUNTRY. (n.d.). Retrieved from <http://www.fao.org/docrep/005/y4473e/y4473e08.htm> [accessed 23 April, 2018]

sought and being developed into mega cities and human population mushrooming in and towards the peripheries of these cities. The rise in human population for want of employment and better standards of living is creating more and more pressure on the local water sources to meet the demands and hence leading to acute water shortages and scarcity.

- **Climate Change**

Climate change caused by natural and man-made emissions contaminate water runoff and cause droughts. Water runoff commonly includes rain and snowfall, both of which contribute to keeping lakes and rivers filled with water. Any changes to water runoff can further affect water availability and disable the preparation for water resource management. The cyclical drought conditions in California from 2014 to early 2017 resulted in harsh water restrictions to preserve resources which put citizens at risk of some of the health concerns raised earlier.

- **Overuse of Water**

Water overuse is a huge issue that a lot of people are dealing with. It may be overused on people, animals, land, or any other number of things. It may also be used for recreational activities without any care about the effects that it may have on the world around them.

- **Conflict**

If there is conflict over an area of land, it may be difficult to access the water that is located there. In the worst case scenarios, people could end up dying if they try to access the water in these areas (due to violence). The war torn countries and areas in the Middle East and Mediterranean region are facing water shortages due to this reason.

- **Distance**

There are a number of areas throughout the entire world that deal with water scarcity because they just aren't close to anywhere that has water. Areas that are considered to be desert, or areas that are secluded, may not have somewhere that the people can get water effectively.

- **Drought**

A drought is, in short, an area which is not getting enough rainfall to be able to sustain the life that is residing there. Some areas are in perpetual drought, whereas other areas may be dealing

with a drought on occasion. Droughts are common all over the world, and there is little that can be done to prevent such things from happening.

- **Governmental Access**

In some countries, specifically those with dictatorships, the use of water may be strictly controlled by those in power, causing a scarcity for those who may be located in those areas of the world. These governments use it as a source of control over those that they are governing, which can be a huge problem.

- **Agriculture**

Agriculture uses majority of available freshwater. The sad thing is that about 60% of this water gets wasted due to inefficient agriculture methods and leaky irrigation systems. In addition to this, pesticides and fertilizers are washed away in rivers and lakes that further affect human and animal population.

There are varied causes and reasons; as seen above, for the shortage and scarcity of water around the world. And since these causes have been identified, there are bound to be a number of effects of the emerging global crisis of water.

A few difficulties and problem areas along with effects of water scarcity have been enlisted by the researcher as follows:

- 1. Hunger**

Water is incredibly required to grow crops and to care for livestock animals. It is estimated that the global use of water for irrigation and agriculture is about 70% and that only 10% is utilized for domestic purposes. As a result, water shortage means the practice of growing crops and farming is greatly impacted. For this reason, water scarcity commonly contributes to lower yields and death of animals particularly in the arid and semiarid regions and as such, it results in hunger, poverty, and thirst.

- 2. Poor Health**

In many developing nations, water scarcity forces people to drink water of low quality from flowing streams, majority of which are contaminated. Accordingly, they are infected with water-borne diseases such as cholera, typhoid, and dysentery that kill people. Water shortage

may also mean sewage systems are stagnant which creates room for the build-up of bacteria and harmful insects that result in infections. Besides, sanitation might become chaotic when water is scarce especially in restaurants, clinics, and public places thus compromising the health of the general public.

### **3. Poverty**

Access to quality water is fundamental to better living standard and economic growth. Schools, restaurants, hospitals, hotels and other businesses need to stay clean for operations to run effectively. Imagine a situation whereby a major school or hotel goes without water even for a day, the situation can be disastrous and leads to enormous economic losses. Restaurants and shopping malls have to be kept clean to attract visitors. Manufacturing and industrial processes, mining activities, and commercial businesses all need large quantities of water to flourish. Without economic activities because of lack of water, then it means higher poverty levels and poor living standards.

### **4. Habitat Loss and Destruction to Ecosystems**

When water is scarce, then it means the natural landscapes suffer the most as it contributes to desertification, loss of plants and death of wildlife and other animals. As a result, these ecological catastrophes create habitat loss that, in turn, leads to food shortages and poor quality of life. For instance, the Aral Sea in Central Asia that used to be the world's fourth largest freshwater lake has been reduced by more than a third in a period of only three decades. The water is now very salty, and the ecosystems within and around it have been extensively destroyed due to overuse of the water resource, mainly influenced by water scarcity in the region.

### **5. Disappearance of Wetlands**

According to WWF, more than half of the planet's wetlands have lost since 1990 which is largely due to water scarcity. The wetlands have become dry to the point of losing its natural capability to hold water. Human activities are the main contributors because of water overuse, pollution, and interference with the underground aquifers.

### **6. Lack of Access to Drinking Water**

The biggest problem that happens when you have water scarcity is that people are not able to get fresh, clean drinking water. The human body can only go so long without water, and a lack of drinking water can result in a number of other problems, which we discuss below.

### **7. Lack of Education**

Water scarcity makes it difficult for people to get the education that they need or that they deserve. Mainly, because those children are either too sick to go to school (which we will discuss below), or they are working to help get water to the home and the family.

### **8. Diseases**

If you don't have clean water access, then you will be more likely to get diseases from the water that you do have. Whether you're drinking the water or using it for bathing, those diseases will get into the body and, in a number of cases, the people carrying those diseases will pass away.

### **9. Sanitation Issues**

Without access to clean water, there is no way to clean food, dishes, or people. When people are not given access to proper sanitation, disease (which we talked about above) ends up becoming much more of an issue than it would have been otherwise. It also causes mental health issues, including depression and anxiety.

## **The role of world organizations in mitigation of the water crisis**

International water law (IWL) has developed mainly over the second half of the twentieth century, and has enjoyed increasing legitimacy in recent times.<sup>18</sup> A range of legal instruments have progressively strengthened key principles of international water law and defined the rights and duties of states with respect to their uses of shared watercourses such as: the International Law Association's 1966 Helsinki Rules; the United Nations Economic Commission for Europe 1992 Helsinki Convention; the International Law Commission's (ILC) 2008 Draft Articles on

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<sup>18</sup> McCaffrey 2013. 'The progressive development of international water law', in F. Rocha Loures and A. Rieu-Clarke (eds.), *The UN Watercourses in Force: Strengthening international law for transboundary water management*, Routledge, New York.

Trans boundary Aquifers; as well as numerous regional and basin-specific agreements and decisions by international courts.

In 1997, more than 100 nations gathered to adopt the UN Watercourses Convention- a flexible and overarching global legal framework that establishes basic standards and rules for cooperation between watercourse states on the use, management and protection of international watercourses.

Within the context of the development of IWL, the UN Watercourses Convention (UNWC) holds an important position. The Convention, which entered into force on 17th August 2014, seventeen years after its adoption by the UN General Assembly in 1997, was negotiated on the basis of Draft Articles developed by the ILC. The Convention's final text is the result of ardent discussions between states and the recommendations of no less than five special rapporteurs. The UNWC was proposed as a response to the acknowledgment that a global legal instrument was needed to bolster cooperation between states over their shared water resources and mitigate the potential for conflict. It is also important to note that the UNWC was meant as a global treaty whose role was to support other watercourse treaties by acting as a template and filling the gaps where coverage was lacking.<sup>19</sup>

In 2015, UN Member States adopted the historic 2030 Agenda, setting universal and transformative goals and targets, and committing to working tirelessly for their full implementation. To ensure that no one is left behind, it will be vital to track progress towards the goals.

This is why Member States follow-up and review the 2030 Agenda and its 17 goals every year at the High-level Political Forum (HLPF). This event facilitates the sharing of experiences, including successes, challenges and lessons learned. It also provides political leadership, guidance and recommendations for follow-up.

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<sup>19</sup> McCaffrey, S., 1998. 'The UN Convention on the Law of Non-Navigational Uses of International Watercourses: prospects and pitfalls', in S.M.A. Salman and L.B. de Chazournes (eds), *International Watercourses: Enhancing cooperation and managing conflict*, World Bank, Washington, p. 17-27.

Every year at the HLPF, an annual theme helps an increased focus along with an in-depth review on a selection of SDGs. In 2018, SDG 6 on water and sanitation is one of the goals to be reviewed.

To provide input to Member States on this goal, UN-Water has produced the SDG 6 Synthesis Report 2018 on Water and Sanitation (unedited version available here). This represents a joint position from the UN family on the global status on SDG 6 and other water-related targets. The report also explores the linkages within SDG 6 targets and the interlinkages between SDG 6 and the other targets and indicators. The report builds on the baseline data on SDG 6 global indicators coming from JMP, GEMI and GLAAS.

From 2 May to 14 September 2018, the findings and the report will be discussed in a multi-stakeholder setting. Participants in the public dialogue will focus on giving feedback on the report, the main messages that will be brought to the HLPF and the way forward.<sup>20</sup>

### **Water scarcity in India**

India is a huge country located in the Asian Continent of the world. Its strategic location of being a peninsula; i.e. the Arabian Sea on the west, the Indian Ocean down south and the Bay of Bengal in the East along with a bestowed topography of the Himalayan range forming the topmost boundaries and the Western and Eastern Ghats decorating the beautiful peninsular border, is a boon to the inhabitants of this land.

Large number of rivers, lakes, ponds, canals and all possible water bodies can be found across the entire land mass covering from North to South and East to West. India is a blessed nation when it comes to its geographical placing, to have been conferred upon such natural resources which are no less than bounties.

Over the passing time and the advent of technology, India seems to be losing upon its natural resources, especially water. Numerous places across the country face a perennial

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<sup>20</sup> SDG 6 Synthesis Report 2018 on Water and Sanitation Archives | UN-Water. (2018, April 25). Retrieved from [http://www.unwater.org/publication\\_categories/sdg-6-synthesis-report-2018-on-water-and-sanitation/](http://www.unwater.org/publication_categories/sdg-6-synthesis-report-2018-on-water-and-sanitation/) [accessed 27 May, 2018]

shortage of water and off late Bengaluru has been notified as the second city in the world after Cape Town to face a day zero in the very near future.

The conditions of not only the metros but also the villages and rural areas is full of apathy where there are no sources of water for either drinking or sanitation and people are forced to depend on contaminated water thus falling prey to innumerable ailments and health conditions.

India is blessed with good rainfall well distributed over 5-6 months in the year. The average annual rainfall in the country is 1170 mm with a wide range between 100 mm in desert areas of Rajasthan to 10000 mm in Cherapunji. The total available sweet water in the country is 4000 billion m<sup>3</sup> per annum. Out of this, over 1047 billion m<sup>3</sup> water is lost due to evaporation, transpiration and runoff, reducing the available water to 1953 billion m<sup>3</sup> and the usable water to 1123 billion m<sup>3</sup>. It is disturbing to note that only 18% of the rainwater is used effectively while 48% enters the river and most of which reaches the ocean. Out of the total usable water, 728 billion m<sup>3</sup> is contributed from surface water and 395 billion m<sup>3</sup> is contributed by replenishable ground water. Against the above supply, the water consumed during the year 2006 in India was 829 billion m<sup>3</sup> which is likely to increase to 1093 billion m<sup>3</sup> in 2025 and 1047 billion m<sup>3</sup> in 2050, as estimated by the Government of India (2009). As the potential for increasing the volume of utilization of water is hardly 5-10%, India is bound to face severe scarcity of water in the near future.

### **The Indian position globally**

Water related problems in India have reached a crisis point and given rise to issues of widespread drought, depleting groundwater levels, salinity, and increasing pollution of water bodies. All these issues relate to an imbalance of demand and supply.

The situation of a gap between demand and supply of usable water is of grave concern, having given rise to a division of people into the 'have' and 'have-nots' in terms of their access to quality water. Apart from drawing geographical demarcations, the water crisis has sharpened and dividing line between the urban and the rural, the rich and the poor. The media reports- about starvation deaths, increasing cases of suicide among farmers, mothers selling off their babies, and the rising graph of criminal activities in rural areas – are not too distant to be

forgotten. They all relate to the plight of the rural poor faced with the situation of unsustainable yield from farmland, due to paucity of water.

Scarcity of water has also affected the performance of several industries, including power plants. Besides the social economic angle, the present water situation has political, legal, environmental, and even religious connotations.

With the planets second largest population at 1.3 billion, and expectant growth to 1.7 billion by 2050, India finds itself unable to serve the vast majority of that populace with safe, clean water.

Supporting 16% of the world's inhabitants is daunting enough, but it is even more so when recognizing that population is crammed into an area one-third the size of the United States. Then consider that India only possesses 4% of the world's fresh water and the crisis can be more fully realized.

India may not be the only nation in this predicament, but theirs is at a stage more critical than most. Severe lack of regulation, over privatization, general neglect and rampant government corruption have led to multiple generations thirsting for more than just a few drops of hazard free water.

The situation has grown to the point that regional disputes have risen over access to rivers in the country's interior. Those disputes take on a global scale in conflicts with Pakistan over the River Indus and River Sutlej in the west and north and with China to the east with the River Brahmaputra. Surface water isn't the only source reaching a breaking point.

Tracing back several generations, the critical situation in India can be linked to a myriad of causes. In modern times though, the concern has moved from the surface to the ground. And it's there where India's freshwater is under the greatest stress.<sup>21</sup>

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<sup>21</sup> The Water Crisis In India: Everything You Need To Know - Business Connect World. (2018, February 15). Retrieved from <https://businessconnectworld.com/2018/01/11/water-crisis-in-india/> [accessed 05 May, 2018]

The World Resources Institute (WRI), basing its findings on a new early warning satellite system, warned that shrinking reservoirs in India could result in water taps going completely dry in the country. Experts also point to research establishing the criticality of groundwater for India's agriculture dependent people.<sup>22</sup>

India's huge population makes it very vulnerable when it comes to water shortage and scarcity. About 330 million people in the country now suffer from regular water shortage issues. A dry spell causes the number of people suffering to rise sharply. Last year some 300 districts spread across 13 states including Uttar Pradesh, Maharashtra, Odisha, Bihar, Jharkhand, Andhra Pradesh, Telangana, and Madhya Pradesh suffered from an acute shortage in the supply of drinking water. Trains carrying drinking water had to be sent to Latur in Maharashtra.

India's economy is largely dependent on its agriculture. Water shortage and drought not only affect the rural districts but also have a disastrous effect on inflation and economic progress. With alarming issues like farmer suicides surfacing, it is time we Indians introspect and take a harder look at water wastage in the county.<sup>23</sup>

The water scarcity conditions in India are primarily manmade. India is neither a dry country nor has any dearth of water resources. The basic problem is the population explosion and mismanagement of resources owing to a number of reasons, on which light would be shed in the following paragraphs.

An effort has been made by the researcher to enlist some of the prominent reasons and causes of water crisis and scarcity in the country. They are as follows:

- Inefficient use of water for agriculture. India is among the top growers of agricultural produce in the world and therefore the consumption of water for irrigation is amongst the highest. Traditional techniques of irrigation causes maximum water loss due to

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<sup>22</sup> India stares at water crisis, urgent steps needed: Experts. (2018, April 19). Retrieved from <https://economictimes.indiatimes.com/news/politics-and-nation/india-stares-at-water-crisis-urgent-steps-needed-experts/articleshow/63828947.cms> [accessed 08 May, 2018]

<sup>23</sup> World Water Day 2017 ? India's Wake Up Call. (2017, December 7). Retrieved from <https://www.mapsofindia.com/my-india/india/world-water-day-2017-indias-wake-up-call> [ accessed 01 May, 2018]

evaporation, drainage, percolation, water conveyance, and excess use of groundwater. As more areas come under traditional irrigation techniques, the stress for water available for other purposes will continue. The solution lies in extensive use of micro-irrigation techniques such as drip and sprinkler irrigation.

Excessive cultivation of water-intensive crops such as rice, wheat and sugar cane has exacerbated the water scarcity. As much as 70% of water delivered through India's limited irrigation infrastructure goes to water sugar cane fields in some states. It's no accident that the sugar-producing states of Maharashtra and Uttar Pradesh have been among hardest hit by the water shortage. Producing a kilogram of sugar cane requires up to 5,000 liters of water, according to the World Wide Fund for Nature.

- Insufficient water per person as a result of population growth. The total amount of usable water has been estimated to be between 700 to 1,200 billion cubic meters (bcm). With a population of 1.2 billion according to the 2011 census, India has only 1,000 cubic meters of water per person, even using the higher estimate. A country is considered water-stressed if it has less than 1,700 cubic meters per person per year. For comparison, India had between 3,000 and 4,000 cubic meters per person in 1951, whereas the United States has nearly 8,000 cubic meters per person today.
- Dwindling groundwater supplies due to over-extraction by farmers. This is because groundwater is an open-access resource and anyone can pump water from under his or her own land. Given how highly fragmented land ownership is in India, with millions of farmers and an average farm size of less than two hectares, the tragedy of the commons is inevitable. India extracted 251 bcm of groundwater in 2010, whereas the United States extracted only 112 bcm. Further, India's rate of extraction has been steadily growing from a base of 90 bcm in 1980, while this rate in the United States has remained at more or less the same level since 1980.
- Reduction in traditional water recharging areas. Rapid construction is ignoring traditional water bodies that have also acted as ground water recharging mechanism. We need to urgently revive traditional aquifers while implementing new ones.

- Sewage and wastewater drainage into traditional water bodies. Government intervention at the source is urgently required if this problem is to be tackled.
- Release of chemicals and effluents into rivers, streams and ponds. Strict monitoring and implementation of laws by the government, NGOs and social activists is required.
- Lack of on-time de-silting operations in large water bodies that can enhance water storage capacity during monsoon. It is surprising that the governments at state levels has not taken this up on priority as an annual practice. This act alone can significantly add to the water storage levels.
- Lack of efficient water management and distribution of water between urban consumers, the agriculture sector and industry. The government needs to enhance its investment in technology and include all stakeholders at the planning level to ensure optimization of existing resources.<sup>24</sup>
- Weak Monsoons. A deficiency in monsoon rainfall for two successive years resulted in serious water shortages in many states. The monsoon season last year ended in September with a 14% rain deficit, while the deficit in 2014 stood at 12%, according to the India Meteorological Department. India gets 75% of its annual rain in the monsoon that runs from June through September. The rains usually spread across the entire country by mid-July after arriving over the southern state of Kerala in early June. Close to 60% of the country's farmlands are rain-fed and more than half of the workforce is employed in the agriculture sector.
- Fallen Forests. Massive deforestation since the 1990s has had a huge bearing on the South Asian monsoon, causing an 18% decline in precipitation over India, according to a study published in the Proceedings of National Academy of Sciences last year.

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<sup>24</sup> Water crisis in India – problem and its solution. (2015, April 18). Retrieved from <https://www.mapsofindia.com/my-india/society/water-the-next-looming-crisis> [accessed 07 May, 2018]

- Rain water wastage. Rain water harvesting is patchy in India so much of the huge amount of water dumped on the country during the monsoon every year just dries up or flows into the ocean. Rain water harvesting tries to capture and store more of the rain water in lakes and ponds and steer it towards ground water aquifers. In 2009 India's Central Ground Water Authority asked Indian states to adopt rooftop rain water harvesting systems in government institutions. The Indian government gives financial help for such projects but just 18 of 29 states have so far adopted the practice.
- Pitiful Policy. The governmental policies are also to blame for the country's chronic water issues. Its subsidies and price supports encourage the over use of water while it continues to fail to build the nationwide network needed to conserve and distribute water. The government should ramp up infrastructure to swiftly store rain water.<sup>25</sup>
- Insufficient and delayed investment in urban water-treatment facilities. Water in most rivers in India is largely not fit for drinking, and in many stretches not even fit for bathing. Despite the Ganga Action Plan, which was launched in 1984 to clean up the Ganges River in 25 years, much of the river remains polluted with a high coliform count at many places. The facilities created are also not properly maintained because adequate fees are not charged for the service. Moreover, industrial effluent standards are not enforced because the state pollution control boards have inadequate technical and human resources.
- Water Wastage in India. By 2040 there will be no drinking water in almost all of India. Between 2030 and 2040, many parts of the world will face fresh water scarcity and India is likely to be one of the worst affected countries.
- Contamination of fresh water sources by elimination of untreated water from factories and industries will further worsen the scenario. Despite having over 18 percent of the world's population, India has only 4 percent of the total available water resources.

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<sup>25</sup> Agarwal, V. (2016, May 10). 5 Reasons Why India is Running Out of Water. Retrieved from <https://blogs.wsj.com/briefly/2016/05/10/5-reasons-why-india-is-running-out-of-water/> [accessed 28 May, 2018]

- Per capita availability of water in India has gone down from 6,042 cubic metre in 1947 to about 1,545 cubic metre in 2011. By 2050, India's burgeoning population and water scarcity will reach alarming proportions.
- Over 90 percent of the waste water discharged into rivers, lakes, and ponds is untreated and leads to further contamination of fresh water sources.
- The greatest waste of fresh water comes from lack of adequate storage and utilisation facilities of river waters.
- India has no desalination facilities to use the abundant seawater resources.
- Pressing need to increase irrigation and the difficulty of creating water-storage facilities. Of the 140 million hectares (mh) of net cultivated area in India, only around 60 mh are irrigated. In order for Indian agriculture to grow at its targeted rate of 4% per year, it needs to increase the area irrigated, introduce new high-yield technology, or expand cultivable land. There is no scope to expand the cultivated area, which has remained around 140 mh for the last two decades. Since rain is concentrated in a few months and unevenly distributed across the country, it is imperative for India to develop the capacity to store and transport water. Although water can be stored either above or below ground, there are limits to how much can be stored through groundwater recharge and water harvesting.<sup>26</sup>

From the numerous reasons and causes listed above, for the impending condition in India as regards water scarcity, it is observed that there are certain causes which resonate the world causes whereas some causes are only limited to the country owing to governmental policies, the mindset of the people and kind of awareness prevalent in the country concerning the grave problem that the country faces today.

### **Inter-relationship of human rights and water scarcity**

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<sup>26</sup> India's Water Crisis: Causes and Cures. (n.d.). Retrieved from <http://www.nbr.org/research/activity.aspx?id=356> [accessed 15 May, 2018]

Amongst the basic necessities critical to survival of man is water. There is no life without water. Hence, right to water and sanitation form a paramount and most fundamental right under right to life as water begets life.

All the leading world organizations promoting international humanitarian welfare and peace have marked right to water and sanitation within their covenants and documents.

The legal status of the right to water in international law is argued to be arising from explicit and implied recognition of rights from the existing human rights instruments available. The explicit recognition of the right to water is evident from the recent human right treaties such as, the Convention on the Elimination of all forms of Discrimination against Women<sup>27</sup>; the Convention on the Rights of Child<sup>28</sup>; and the Convention on Rights of Persons with Disabilities<sup>29</sup>. And the implicit recognition of the right to water is mainly argued to have its relevance from the right to life and the right to adequate standard of living originating from International Human Rights instruments such as, Universal Declaration of Human Rights (1948)<sup>30</sup>; International Covenant on Civil and Political Rights (1966)<sup>31</sup>; International Covenant on Economic, Social and Cultural Rights<sup>32</sup>. These conventions confer international obligations on the parties to work towards accomplishment of the duties specified in the documents they are party to. However, the explicit recognition is for the targeted individuals who are beneficiary to the conventions mentioned above such as: women, children's and person with disabilities respectively and the implicit recognition is for all as those are the convention or

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<sup>27</sup> Convention on the Elimination of All Forms of Discrimination against Women (adopted by General Assembly Resolution 34/180 of 18 December 1979, entered force on 3 September 1981), Article 14, para 2.

<sup>28</sup> Convention on the Rights of the Child (adopted by General Assembly resolution 44/25 of 20 November 1989, entered force on 2 Sep. 1990), Article 24, para 2.

<sup>29</sup> Convention on the rights of persons with disabilities (adopted on 13 Dec. 2006 by General Assembly resolution 61/106, entered force on 3 May 2008), Article 28 (2).

<sup>30</sup> United Nations Universal Declaration of Human Rights, 1948, Article 25 (1): Everyone has the right to a standard of living adequate for the health and well-being of himself and of his family, including food, clothing, housing and medical care and necessary social services, and the right to security in the event of unemployment, sickness, disability, widowhood, old age or other lack of livelihood in circumstances beyond his control.

<sup>31</sup> UN's Human Rights Office of the High Commissioner, International Covenant on Civil and Political Rights Article (Adopted and opened for signature, ratification and accession by General Assembly resolution 2200A (XXI) of 16 Dec. 1966 entry into force 23 Mar. 1976, in accordance with Article 49), Article 6(1).

<sup>32</sup> UN's Human Rights Office of the High Commissioner, International Covenant on Economic, Social and Cultural Rights (Adopted and opened for signature, ratification and accession by General Assembly resolution 2200A (XXI) of 16 Dec. 1966 entry into force 3 Jan. 1976, in accordance with article 27), Article 11 (2) and Article 12.

treaties having universal recognition and equally applicable to all the human beings, unless restricted by law. But it is interesting to note that recognition of both the types mentioned above has already recognized the right to water in one form or the other. Therefore, it can be understood as the recognition has only ascertained the right a legal status, which perhaps initiates the implementation but certainly that does not guarantee the realization as such.

The implicit recognition of the right to water from the right to life in international domain and in context of India share analogy in their derivation, objective and the inefficacies felt in their realization as well. The derivation of the fundamental right: Right to life-Article 21 in India, does not only confine to mere existence but also guarantees ‘right to life with human dignity’<sup>33</sup>. This phrase (the right to life with human dignity) had been defined extensively by the higher judiciary in various case laws, and the extensive elaboration and interpretation given to the word dignity attached with right to life is one of the prominent factor for broader interpretation of right to life in national jurisdiction<sup>34</sup>. The judiciary has clarified that the right to life with dignity does not restrict itself to animal existence, but it extends to the availability of basic-necessities for dignified life of an individual, such as: food, shelter, water, education, free movement and so on<sup>35</sup>. However, ‘Article 21-Right to life’ in Indian Constitution is worded in negative terms, but the judicial interpretation in various case laws have made the right inclusive of several other dimensions of life giving it true purpose. Indeed, clarifying that the article surely has both negative and affirmative dimensions attached to it, thus conferring origin of positive rights or obligations from such fundamental rights<sup>36</sup>.

### **Grass root level analysis of water scarcity: Mumbai and suburbs**

In an attempt to collect empirical data for the said study, a few interviews of the authorities of local municipal bodies and an online survey to garner data and information was taken up by the researcher. Also a few schools and hospitals were taken up for the said study to understand how they deal in times of water cuts and shortages.

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<sup>33</sup> Maneka Gandhi V. UOI, AIR 1978 SC 597

<sup>34</sup> Peoples Union for Democratic Republic vs Union of India and Others (1982) AIR 1473, 1983 SCR (1) 456.

<sup>35</sup> Francis Coralie v. UT of Delhi, AIR 1978 SC 597.

<sup>36</sup> Jain, M.P., *The Constitutional Law of India*, 45th ed., CLA, p. 230, 2008.

An interview of the Deputy Engineer (Respondent I) of the water supply department from the local municipal body was conducted by the researcher to collect data from the said authority on how they manage water supplies to the various parts of the city in times of water scarcity and shortages.

The TMC caters to around 23.5 – 24 Lac of the population within the district. Respondent I also informed the researcher that they have partial shutdowns as monsoons have been good in the past two years and hence there is not any acute shortage as such.

Respondent I, on being enquired about areas in the municipality being worst hit by water scarcity, responded that the tail ends of the city were struck owing to illegal pipelines and connections and no apt distribution system.

The TMC also has started an Amnesty Scheme to identify and keep a check on the illegal water supplies occurrences in the city. Also, it was recorded by the researcher that any building complex having more than 300 flats required a Sewage Treatment Plant (STP) compulsorily. The TMC after the construction of the complex pays a visit to ascertain the working condition of the STP as per standards laid down by TMC.

A conventional water treatment plant treats the water reaching the TMC from all sources; with pre-chlorination, post-chlorination and filtration, being carried out on the water to make it potable water fit for drinking.

An estimated 37% of the water is considered to be non-revenue water, as per the audit conducted last in the year 2007-2008. As per Respondent I, the figures are not alarming and are in sync with almost all the metropolitan cities across the country.

Next the Hydraulic Engineer Department of the MCGM was surveyed to understand their sources. MCGM primarily receives water from seven sources within and outside the city. The pipe water supply is one of the earliest civic services provided by Hydraulic Engineer Department, one of the oldest departments of Municipal Corporation of Greater Mumbai. It was established under Section 73A of the MMC Act 1888. The main objective of Hydraulic Engineer department is to operate, maintain and provide water and related services to the

citizens of Mumbai. It is also committed to the important task of constantly improving and upgrading the Water Distribution system of Mumbai. The water supply for Mumbai is sourced from 7 different lakes and is treated at 4-Water Treatment Plants as per drinking water standards specified in IS 10500: 2012 before being distributed to the citizens. The water is distributed from 2-Master Balancing Reservoir, 27- Service Reservoirs across the city of Mumbai and through the maze of 6000 km long distribution network spread all over the city. The complex water supply system of Mumbai has another unique feature that almost entire water supply distribution is by gravity due to typical terrain geography.

The Mumbai Water Supply system is one among the largest in the World and perhaps second largest in Asia after Tokyo. The Bhandup Water Treatment facility is the largest (capacity) such facility at single location in Asia. MCGM uses under-ground water supply tunnels ranging from diameter 2200mm to 5500mm totaling in length of about 100 Km to convey raw / treated water. Daily more than 1000 number of valves are operated to regulate water supply in 250 water supply zones.

Also an interview was conducted at the STEM water distribution and infrastructure Co. Pvt. Ltd. Respondent II at this company gave a multitude of information to the researcher.

STEM is a step forward to become First Drinking Water Distribution Company of a kind in India, is a Joint venture of local self-governments of Three Municipal Corporations & Zilla Parishad, formed on 10thDecember, 2010.

Also, one multi-specialty hospital in the city along with a government run hospital was interviewed by the researcher to study the effects of water scarcity.

The respondents in both the hospitals had resonating views and responses. They said that they faced water shortages and the municipal authorities did not pay any attention that it was a hospital and absence of water would create serious life and death issues.

The private hospital informed that their laundry and kitchen services was outsourced so they saved on a huge amount of water which would have been used otherwise. Both hospitals

required maximum water in the operation theatres and that sanitation department always consumed minimal water.

The private hospital, on accounts of anonymity said that they were forced to use up the fire tank reserve water when there was no water in the city for four days. It's a grave situation when a multi-specialty hospital has to use water from the water tank so as to meet its demands on water usage, is an observation made by the researcher.

Water tankers are ordained from respective municipalities in severe water crisis in both the hospitals to meet the water demands. The receiving end is the patient who often has to face multiple issues, one of the most dangerous being the rescheduling of surgeries as they can happen only when there is a full-fledged water supply in the operation theatre. One can only think about survival rates when the surgeries are critical and to be done in an emergency.

A local school too was taken up for sample study and they too had no better conditions. The students were forced to use the washrooms without water or often sent home; if they had a residence nearby, to relieve themselves.

As a part of the study, the researcher also undertook an online survey from individuals hailing from different parts of the city and nearby locations. They had mixed responses with respect to the water shortages they face.

**Figure 1**

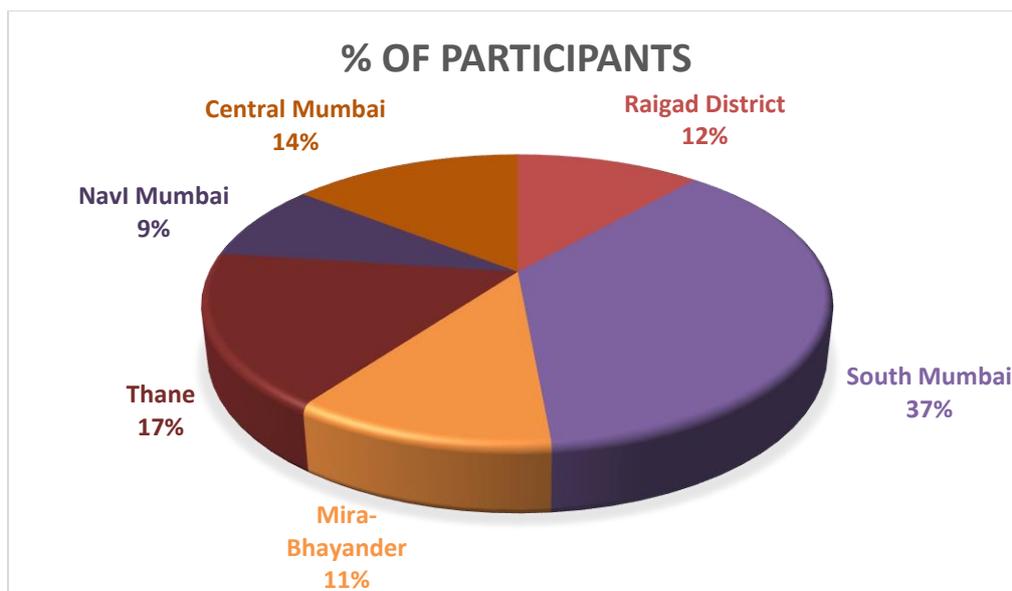


Figure 1 represents the cities and number of people who participated in the online survey.

**Figure 2**

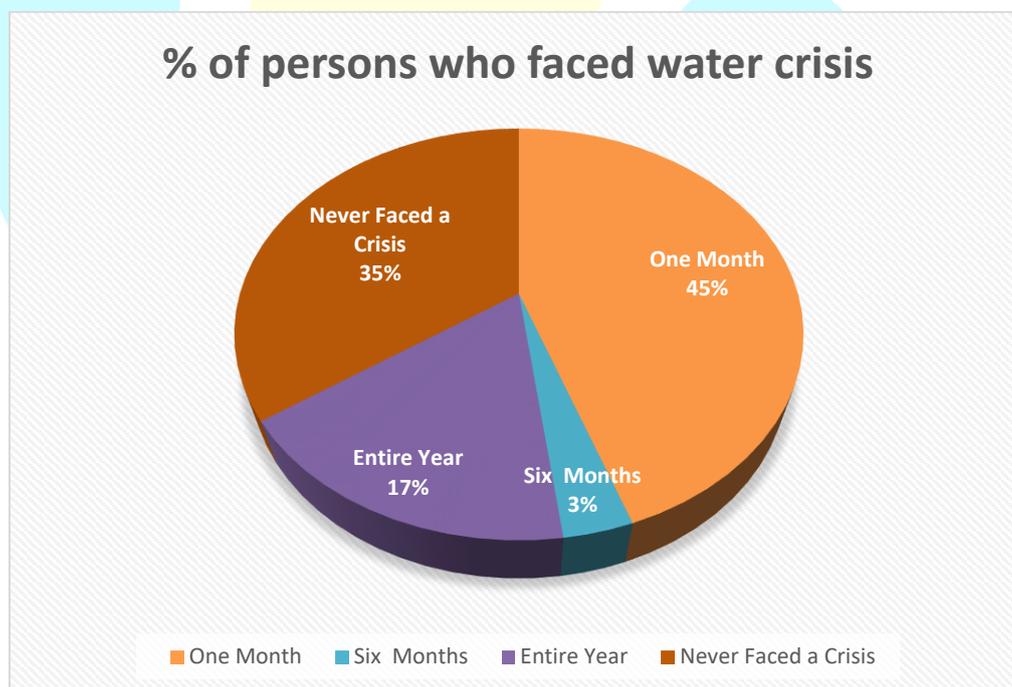


Figure 2 represents the number of persons who have faced water problem along with the time limit they faced the same

Most of the respondents only complained of their daily activities being marred by the shortage of water but never had faced any life threatening situations.

Also, most respondents were distressed as no local municipality or body came to their rescue when they faced water shortages and they dealt with the situations on their own accords.

An observatory technique was used to collect data from the worst water crisis hit city in India, Bengaluru and it was found by the researcher that most areas had water supply in total normalcy and only the outskirts of the city was severely hit, where the lowest strata of the society lived.

The inference drawn by the researcher is that the metropolitan cities are no better placed than the rural parts of the country in terms of water scarcity. They too reel under similar problems but owing to availability of better infrastructure and management, the people in the city face lesser issues in comparison to their rural counterparts.

## **Conclusion**

After the completion of the said study; with its limitations in place, it can be safely concluded that India is no different from the other parts of the world when it grapples one of the most serious problems of the century, water scarcity.

India being blessed with ample water resources, ideally should not be one of the worst hit countries facing water woes. Yet since it is one of the countries, it is time to introspect what is going awry and hence overcome the situation in full measure.

Despite the country being signatory to the leading world instruments and documents for human rights along with having a strong set of fundamental rights in the constitutional machinery in place, the right to water is still not realized in letter.

India faces water scarcity only and only due to self-created problems which once addressed, the scenes would change.